AUTISM SPECTRUM DISORDERS (ASD) AND LEARNING SUPPORT SYSTEMS IN POST-SECONDARY EDUCATION

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Approval of The Dissertation

This Dissertation, by Megan Brightbill has been approved by the committee members below, who recommend it be accepted by the University of Bridgeport, College of Health Sciences in partial fulfilment of requirements for the degree of Doctor of Health Sciences (D.H.Sc.)

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Abstract

Autism Spectrum Disorder (ASD) is a condition affecting numerous individuals and families. As the improvement of ASD analysis continues and diagnostic coding is updated, opportunities for an earlier detection can be made. This early detection has resulted in more cases being identified, but has also led to more services and a better understanding of the health science of the condition. Although ASD consideration can relate to a broad range of conditions, the diagnostic deficits put in place by the American Psychiatric Association are the criteria used for this review. With better support systems in place and inclusive learning being a common theme in elementary and high schools, adult ASD students are moving into post-secondary education at an increased rate. Colleges and universities are well-versed in disability services, however, ASD students require a specialized kind of support as many of these students display a variety of deficits related not only to the classroom, but the college environment as a whole. In this review, five methods of post-secondary support are reviewed; mentoring, transition programs, assistive technology, coaching, and universal design. These support methods are then compared with the diagnostic coding for ASD to provide recommendations of best practices. Although each method has shown positive feedback from ASD students, none fully meet all of the diagnostic criteria and it is likely that the best option of support would be a combination of methods.

Keywords: Autism Spectrum Disorder (ASD), post-secondary, disability, coaching, mentoring, Universal Design, transition, assistive technology

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AUTISM SPECTRUM DISORDERS (ASD) AND LEARNING SUPPORT SYSTEMS IN POST-SECONDARY EDUCATION

Chapter 1

Introduction

The post-secondary landscape is filled with learners of varying stages and abilities. Some institutions have robust programs to help support student learning and promote success particularly when there are disabilities present. However, college level students with Autism Spectrum Disorder (ASD) have a wide variety of social and intellectual incapacities that make each individual case unique and pose significant challenges to success in a post-secondary setting. ASD prevalence has increased by 150% since the year 2000 and some communities have an incidence of 3% ASD diagnosis just within their geographical location (Baio et al., 2018) At the same time that these increases are being reported, many colleges and universities have not altered the disability services they provide to enrolled students (Baio et al., 2018). Compiling the prevalence of ASD poses several challenges due to heterogeneity of symptom presentation, absence of biologic markers, and updates to the diagnostic criteria (Baio et al., 2018). Some challenges in diagnosis relate to the timely presentation of symptoms, and the likelihood of overlapping intellectual disorders. Historically, autism was considered to be a disease of psychosis, with preliminary research citing challenges such as difficulty with speech, obsessive behaviors, macrocephaly, and difficulty in building relationships with others (McGonigle, Handen, & Lubetsky, 2011). After thirty years of research following the initial nomenclature of autism, some of the same characteristics

are still accurate and apparent in the diagnosis today. The major difference, however, is how the spectrum of disorders within the term autism has developed, thus the nomenclature of 'spectrum disorders' making the challenge of support systems at any age of diagnosis more complicated. ASD is a neurodevelopmental disorder and although a myriad of impairments can be observed, social and communication deficits, non-verbal communication, repetitive behaviors, and sensory issues are the most common (Deacy, Jennings & O'Halloran, 2015). The Autism and Developmental Disabilities Monitoring (ADDM) Network has reported that prevalence of ASD among children aged 8 years has more than doubled from 2002 to 2012, where one in 68 children were diagnosed with ASD (Baio et al., 2018). This Network is the only system of surveillance that estimates ASD by areas of the county utilizing subgroups including sex and race/ethnicity (Baio et al., 2018). It also includes the diagnostic criteria in the epidemiological research which helps in the contribution to updating those criteria. According to the American Psychiatric Association (2013):

> It remains unclear whether higher rates [of ASD] reflect an expansion of the diagnostic criteria of DSM-IV to include subthreshold cases, increased awareness, differences in study methodology, or a true increase in the frequency of autism spectrum disorder (p. 55).

Factors that may be contributing to the increase in ASD prevalence include the fact that disability legislation and changes in diagnostic coding has occurred, the public is more aware of ASD, and that there have been improvements in the ability to diagnose ASD among individuals without other intellectual disabilities (Van Hees, Moyson, & Roeyers, 2015).

There is currently a surge in the number of individuals with ASD who are at the appropriate age to begin college because there is an increase in the number of children diagnosed with ASD. In the ideal situation, individuals with ASD conditions would be evaluated with the focus on employment capabilities and the appropriate education or training sought, as many students in the ASD community are well-suited for the potential of learning new things (McGonigle et al., 2011). The reality, however, is that post-secondary institutions need to be prepared for attending ASD students with varying capabilities. The concern is more about the environmental change common to college life and the challenge of finding what resources are available to support ASD students in post-secondary education. The fact that more high school graduates with ASD are seeking further education is a positive development (Baio et al., 2018). As we have learned more about properly diagnosing ASD and have been able to provide earlier detection, some individuals with ASD are experiencing greater functioning capabilities within society and the workplace. Potentially this is because of the support options made available when the ASD diagnosis occurs early. Furthermore, these more well-adjusted young adults are now more likely to enroll in post-secondary educational institutions. It is estimated that forty percent of transition-aged adults with an ASD diagnosis enroll in a post-secondary educational system (Volkmar, Jackson, & Hart, 2017). Community colleges in particular may be the key to the development of persons with ASD preparing them for a more self-sustaining lifestyle because of these increasing numbers. To date there have been more unsuccessful attempts at degree completion for college students with ASD, versus the non-ASD diagnosed general population of students, and the highlighting factor appears to be insufficient support systems (Jackson, Hart, & Volkmar,

2018). Some research has indicated that students with ASD lack the motivation needed to be successful in post-secondary coursework because of the necessary wide range of subject matter which is outside of their restricted areas of interest; a common trait to the disorder (Rando, Huber, & Oswald, 2016). Although ASD students may have such strengths as a strong memory, diligent demeanor, and a knack for the use of technology, they may also struggle with the reduced structure of college life, loneliness, anxiety, and depression (Anderson, Carter, & Stephenson, 2018).

The faculty, staff, and the institution itself must recognize the variety of disabilities that can be present and have a support system in place that can be individualized based on those needs in order for post-secondary institutions to successfully support students with ASD. Characteristics common to ASD may easily impact the academic experience in a college setting where class sizes, last minute room or staff changes, varying seating arrangements, or sensory issues related to flickering lights or typing on keyboards can create significant stress and anxiety (Lucas & James, 2018). Students with ASD can succeed with supportive learning environments and campus-based programs that include a holistic approach (Van Hees et al., 2014). The transition from high school to the college setting is undoubtedly difficult for anyone. Highly functioning students with ASD may not seek support until they begin to fail causing more stress and increased anxiety (Van Hees et al., 2014). Recognizing the needs of students with ASD in post-secondary education and determining the best practices for ASD student success in the college setting is the aim of this systematic review.

Chapter 2

Review of the Literature

Autism Spectrum Disorder

Originally termed simply autism; Autism Spectrum Disorder (ASD) is characterized by pervasive impairments that commonly include challenges in social skills and communication. In the ground breaking work of Leo Kanner, publishing his 1943 text *Autistic Disturbances of Affective Conduct*, the first real look at what would later become ASD materialized. Kanner discovered patterns of behavior which included speech disturbances, echolalia, compulsive and repetitive behaviors, the presence of macrocephaly, and the inability to make affective contact with others in the eleven children he studied, the majority of whom were male (McGonigle et al., 2011). Kanner coined the term "autism" in his work and because of that term, the focus honed in on the mental issues and the related disorder of schizophrenia; often the two conditions were interchanged during diagnosis. As research progressed into the 1950's and 60's, a look at the personal relationships these children experienced early in life and the role of environmental effects became of significant interest. There was concern that the function of the family was a determining factor in autism and that children who were subjected to a lack of warmth or unresponsive parents was to blame for the development of the condition (McGonigle et al., 2011). This early belief is significant as we explore the challenges of creating relationships with children and adults, both inside and out of the home, who are diagnosed with ASD. Today, these theories have been refuted although areas of psychiatry, genetics, biology, and neurology have not been able to find the root cause of ASD. It is important to acknowledge that the presence of a support system is

irrefutably important to the care of ASD sufferers (McGonigle et al., 2011). Understanding the evolution and conceptualization of the disease helps us appreciate the advances that have been made since the concept has been presented, and also creates an opportunity to prevent the repeat of these hypotheses.

The American Psychiatric Association (APA) generates and updates criteria and diagnostic arrangements for ASD in their Diagnostic and Statistical Manual of Mental Disorders (DSM) text. This book, now on its fifth edition, offers standard language and classifications about mental disorders including ASD, which is used by researchers, clinicians, health insurance agencies, and policy makers. The American Psychiatric Association's (2013) current DSM-V references ASD in the neurodevelopment disorder category and explains:

> Autism spectrum disorder is characterized by persistent deficits in social communication and social interaction across multiple contexts, including deficits in social reciprocity, nonverbal communicative behaviors used for social interaction, and skills in developing, maintaining, and understanding relationships. In addition to the social communication deficits, the diagnosis of autism spectrum disorder requires the presence of restricted, repetitive patterns of behavior, interests, or activities (Section II, page 31).

The DSM-V reference details that conditions such as autism and related spectrum disorders are often coupled with an additional learning disorder or intellectual disability (American Psychiatric Association, 2013). Intellectual disabilities can include challenges in reasoning and judgement or problem-solving and planning skills which are surrounded by the hallmark ASD conditions of difficulty in communicating and adapting in social

environments. If we consider the educational process, these skill sets are all important factors that contribute to academic success (Elias & White, 2017). In the high school settings, persistent support and communication is provided between the school and the family as ASD students struggle with tasks that should be managed independently (Rispoli, Lee, Nathanson, & Malcolm, 2019). In the college environment, the expectations change and the challenges of self-reporting and available resources can become an issue as students with ASD have a 38.8% chance of completing their degree compared to 52.4% of college students with disabilities in general (Jackson et al., 2018). As has been clearly established, first time college students face new demands including social, emotional, and organizational challenges. These are the exact issues that are already inherently problematic for students with ASD, and so are amplified when ASD students enter the college environment. The typical college age of 18-25 years is also considered to be a time of emerging adulthood development, characterized by identity formation and transition (Elias & White, 2018). Having the ability to self-advocate and understand when to ask for assistance, knowing the available resources, and managing one's self outside of the classroom are major hurdles for ASD students. Jackson et al. (2018) report that:

> While difficulties adapting to the increased academic challenges of post-secondary education may contribute to the discrepancy in rate of degree completion, non-academic factors are likely to have a greater impact. For students with ASD these factors include disorder-related social, communicative, sensory, routine adherence, and executive functioning impairments, and the impact of these impairments on the students' ability

> to adapt to the changing environment, social demands, fluctuating schedules, and management of daily living responsibilities associated with collegiate life (p. 639).

Disability Services

The Office for Civil Rights within the United States Department of Education enforces the rights that are given to students with disabilities in post-secondary educational environments (US Department of Education, 2011). These rights are not the same as the coverage found in the secondary level and follows Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act of 1990 (US Department of Education, 2011). The main difference in the management and interpretation of the law from the high school level to college is that as the student transitions, more responsibility is given to the student. The college-ready student with ASD, or any disability, does not have to notify the college or university of their disorder and is not required to register with the disability entity within the institution (US Department of Education, 2011). However, if a student wants or needs accommodations, they must self-report their condition and provide the proper medical documentation. Elias and White (2018) reported that parents of students with ASD have unique difficulties stating:

> Specifically, the inclusion of difficulties with self-advocacy, managing intense emotions, and managing personal/adaptive skills suggest that these needs may be distinct from students with ASD who are either in high school or not currently enrolled in formal education. Specifically, it

> appears that difficulties with speaking up for oneself and emotion regulation are pervasive in the postsecondary domain (p. 741).

Self-reporting a disability is innately difficult for an ASD student since it requires them to initiate a one-on-one discussion in a potentially new environment (Elias & White, 2017). This is a task many students, regardless of their disability, may find demeaning and uncomfortable. In fact, the most recent data indicates that 19.4% of undergraduate students have a reported disability which has increased from 11% determined in 2007-2008 (US Department of Education, 2019). However, a strong probability exists that there are college-enrolled students who do not report their conditions. Differences in the manner in which post-secondary systems handle ASD often results in parents aiding their adult ASD student (Elias & White, 2018).

Once a school has identified that a disability is present, appropriate academic adjustments can be determined based on individual needs. Accommodations such as a longer time to complete examinations, the allowance of recording devices, providing note takers, or adaptive software for visual or audio impairments are examples. An important piece of the policies surrounding college disability services is that the institution, although required to provide reasonable accommodations, is not required to lower or substantially modify the course, requirements, or the fundamental nature of the course. This includes providing any tools or services that would incur undue financial burden (US Department of Education, 2011). Another legislative act, now known as the Individuals with Disabilities Education Act (IDEA) was passed in the 1970's granting free appropriate education to children with disabilities through ages three to twenty-one (Leake & Stodden, 2014). The overall purpose of the IDEA is to prepare students with

disabilities for adulthood. It does not focus specifically on ASD; however, it has been documented that less than 10% of these students have obvious disabilities such as blindness or conditions requiring wheelchair use (Leake & Stodden, 2014). These unseen disabilities, which can include those students with ASD, give the impression on a college campus that ASD students are rare. Once again, the stigma surrounding disabilities can also cause ASD students to not self-report or obtain adequate accommodations to which they are entitled (Leake & Stodden, 2014). It is important that all people are made to feel as if they belong and part of the disability rights movement was to ensure people are not mistreated or unincluded. Students who report feelings of belonging, and are developing social networks tend to be more successful academically than those students who, after eight weeks of arriving at college, do not feel as though they belong (Leake & Stodden, 2014). Therefore, although legally ASD students may be granted an open door to the possibility of education, appropriate social supports for students with ASD are not required. Leake & Stodden (2014) suggest college campuses work to improve the college culture, advocate for training faculty, administration, and staff about disabilities and increase research on the topic of social integration for students with disabilities.

In the current academic setting at the college level, when students are granted accommodations through the disability office staff member, the self-advocating work of the student continues. Although the disability office sends notification to the faculty members whose classes the student is enrolled in, the student must then indicate to each individual faculty member which accommodations they would like to have provided to them. For example, if a student is granted additional test taking time and a quiet space to take exams, the student may determine that they will take exams in a testing center, but

without the additional allocated time. For ASD students this means that they need to reach out to each professor to discuss and plan the accommodations that they would like followed. This process puts undue stress on the ASD student and creates more barriers than are necessary (Kuder & Accardo, 2018). While some institutions have reported facing a larger number of ASD students in post-secondary education, most of those institutions are continuing to use the same services and policies that are used for all other students with varying disabilities (Kuder & Accardo, 2018). Even if the situation were more promising, the services provided for ASD students in most colleges do not cover support between classes, in dorm rooms, or for commuting students during travel time. There is significant concern for students managing themselves on campus outside of the classroom time. This concern spills into the overall success for ASD students as Kuder and Accardo (2018) report:

> Social skills are one of the core diagnostic features of individuals with ASD. Difficulties with social skills can not only effect social relationships but impact academic success, as students with ASD may have difficulty asking questions, participating in discussions, and collaborating with peers in groups (p. 727).

For ASD students who attend traditional colleges or universities, where they would reside on campus, significant planning is important for the times when a student is out of the classroom. The American Psychiatric Association (2013) indicates that students with ASD fundamentally have a disadvantage in education noting:

> Extreme difficulties in planning, organization, and coping with change negatively impact academic achievement, even for students with above average intelligence (p. 57).

In one study where 23 ASD students were interviewed about their college life experiences, challenges of education, student life, and daily living were all identified (Van Hees et al., 2014). Managing time and the organizational skills required to be successful are potentially treacherous barriers to students who suffer from a condition on the autism spectrum.

Current Models

There are a variety of ASD student success models being piloted or regularly used in colleges across the country and internationally. During a review of the literature, commonly found models used to increase the success of students with ASD in the college environment emerged. The current models of mentoring, transition programs, assistive technology, universal design, and coaching will be analyzed. In addition, Appendices A and A1 will address the DSM-V diagnostic criteria for autism spectrum disorder and review whether the current models discussed addresses each of these diagnostic deficits.

Mentoring

Specialist mentors, as opposed to peer mentors, is one way to assist ASD students who are moving into their first year of college. Mentoring can be an effective way to support students with ASD as there is a focus on the individuals needs and optimizing the potential for success. One study, completed in the United Kingdom, focused on mentoring ASD students and those with mental health problems, evaluating their

measures at the start of the academic year and after each semester for a full term. Mentee participants completed a survey and a limited interview prior to the start of the academic year, indicating their expectations, skill level, and what they determined their support needs to be at that time (Lucas & James, 2018). Mentors in this program were specialists in their field, employed by the institution and trained on ASD and mental illness along with management and coping skills. In general, the students who participated indicated that their goals for the program included hope that their mentee would help them with academic skills, that they would have assistance adapting to college life, building relationships and social skills, and improvement in their own well-being (Lucas & James, 2018). Overall, the participants rated the experience with their mentors as highly satisfactory in each of the semesters, and were appreciative of the personal relationship that was developed with the mentor who stayed with the student throughout the academic year (Lucas & James, 2018). This may be a benefit to professional mentorship programs that do not depend on peers whose participation can vary. The majority of the mentors in this study also reported being satisfied with the experience, noting that they honed their own personal skills throughout the academic year (Lucas & James, 2018).

A central theme in the mentoring model presented in this study focused on the development of a tailored partnership between the mentor and mentee (Lucas & James, 2018). Because mentors worked individually with students, they were able to offer assistance specific to the needs of the individual with ASD. The tailored partnerships focused on creating bridges between what the ASD student needed assistance with, and what the university standards or processes required (Lucas & James, 2018). Bridges were also built between the support the ASD student was used to experiencing while living in

their home environment, and having a point of contact in their new college community. Finally, bridges were intentionally built between the ASD students and the support systems already in place within the institution (Lucas & James, 2018). As an example, the mentee could bring communication challenges to faculty and academic departments, working with the mentor to overcome barriers. Students who participated in this program found it to be helpful because they had some shared experiences with their mentee using academia as a common thread. Mentees also reported that the personal relationships they built allowed them to have someone they felt comfortable going to just like a friendship (Lucas & James, 2018).

Potential limitations of this study included the small sample size, but there were many positive impacts on the students being mentored through their academic endeavors for those who did participate. Ideally, mentorship in this model requires the mentors to have a firm working knowledge of the university and its services. Lastly, there was a significant challenge in the determination of how much time the professional mentor would need to spend in this work, and it varied to some degree between participants (Lucas & James, 2018). In some institutions, budgetary restraints may be the determining factor, however, more evaluation needs to be completed on similar programs to establish a guideline of how much time is reasonably needed to perform the mentoring tasks.

Peer mentoring has also been used to help ASD students overcome the obstacles of college life. In one program, peers who were post-graduate students from the School of Psychology and Speech Pathology, and the School of Occupational Therapy and Social Work were paired with ASD students in their first year of school (Choo, Mazzucchelli, Rooney, & Girder, 2017). In this pilot study, ten ASD students were provided peer

mentors with specific educational training who would provide individualized support based on the needs of the ASD student. The mentors who volunteered were given additional training in ASD-related topics, along with content on student services and engagement tools such as boundary implementation and confidentiality (Choo et al., 2017). The mentors met together weekly as a group throughout the term to discuss concerns or challenges. ASD students also meet weekly with their individual mentors and the pairs were encouraged to attend a weekly group session to assist with social and communication skills (Choo et al., 2017).

Interviews with the mentees at the end of the program revealed that they felt the program helped them with their transition from home to a post-secondary institution, gave them assistance in managing academics, provided support with their emotions, social skills, and communication abilities (Choo et al., 2017). Some improvements that were suggested were to start the program prior to the start of the school year, and to include more activities to promote social interaction. In review of the pre/post testing with the ASD participants, the increase in communication apprehension was most notable at the conclusion of the program (Choo et al., 2017). This is significant as ASD students often do not ask for support as they are not confident in communication with others about their needs. This peer mentoring program provided them a consistent contact whom they eventually felt comfortable with, and they could ask for and receive the information needed.

Transition Program

At a small liberal arts college in the northeast, a transition program has been operational, running as a specialized program within a larger division of student affairs.

The program is designed to help students with ASD transition from high school to the college environment. Although students may be strong academically, they may find the social experience especially difficult. At the same time, academic challenges may continue to exist for students where a family member or loved one at home was previously assisting with organizational tasks and study skills. In this transitional program, Shmulsky, Gobbo, & Donahue (2015) describe that the following six practices are followed:

1. Contact students and their parents before the beginning of the academic year
2. Acclimate small groups of students to campus early
3. Build alliances with parents
4. Select trained advisors
5. Predict and meet residential needs
6. Provide ongoing support during the first year (p. 237)

Each practice is in place to complement the collective needs of ASD students while also allowing some flexibility to meet the individual needs required of this type of college student (Shmulsky et al., 2015). In contacting the parents early, the team is able to ask a lot of questions and learn about specific diagnosis that may affect how they learn. Because the team has this early contact, they can better prepare services deemed appropriate from disability services, mental health counseling, residence life, and/or general health services (Shmulsky et al., 2015). Small group sessions with students and parents are made available to give ample time for a campus visit. Getting ASD students on campus in advance can help with anxiety and allow for parents and students to ask a

lot of questions about the physical space. A suggestion to aid with the success of this early orientation is to include successful students from previous academic years to serve as orientation leaders as they can speak to student life and the student culture more effectively (Shmulsky et al., 2015).

The third prong in this transition program is to build alliances with the parents of the ASD student. When a student with ASD applies to college, it is important to note that it is very likely the student's parents have been advocating for their education for many years (Shmulsky et al., 2015). Parents often hold the key to the information on what has been tried in the past and, more importantly, what has worked in their child's educational career. It is imperative for the transition team to obtain a clear indication of the strengths and concerns the parents have about their child starting a post-secondary path, so that stumbling blocks can be avoided as much as possible (Shmulsky et al., 2015). It is important to understand that secondary students with ASD are supported through the Individuals with Disabilities Act and do not need to self-advocate although many parents work diligently to ensure their child has what is needed (Smith et al., 2017). In the post-secondary environment, the Americans with Disabilities Act comes into play and at this time, students must self-disclose. The transition process is not seamless and students who have not previously had support or have gone undiagnosed are not tested to participate in these types of programs. Hiring trained advisors, who understand the complexities of ASD are matched with student participants early in the process. Again, this early engagement creates a welcoming and safe environment for the student, building a relationship with someone at the campus who they can reach out to as needed (Shmulsky et al., 2015). Prediction of the residential needs can be daunting as is the idea of dorm life

to many college students. In this program, the transition team works to collect information on what sensory issues the ASD student may have including lighting and noise levels. They also work to pair ASD students with a roommate who is willing to work with the manifestations an ASD student might present with, and finally the team considers whether a single room is preferable while communicating with residential staff who may need to be aware of the ASD conditions (Shmulsky et al., 2015). The provision of ongoing support in this transitional program can vary by student. In this particular program, the use of technology and digital resources have minimized the cost involved with one-on-one care (Shmulsky et al., 2015). Because this institution has twenty-five to thirty annual participants, the manpower and time can add up quickly. In the first year of the transition program being offered, thirty ASD students participated and 90% of them successfully completed their first college year (Shmulsky et al., 2015). The cumulative grade point average (GPA) for this group of students was 2.74 which was higher than the overall average of first-year students at the institution, with thirteen participants receiving a GPA of 3.0 or higher (Shmulsky et al., 2015).

In a different transition program, an Autism Summer School plan was created where students participated in a three-day workshop that included two overnight stays. Eligibility for this program was determined through an online application process, including verification that the student had a diagnosis of autism, ASD, or Asperger's Pervasive Developmental Disorder. The applicant also had to be 16 years of age or older, and have a plan to apply or have already applied to a university. Over three years, in five occasions, a total of 125 students participated in the summer school program, and in general, proved to gain a positive response (Lei, Calley, Brosnan, Ashwin, & Russell,

2018). In this transition program, attendees would follow a schedule each day structured around the themes of work, rest, and play (Lei et al., 2018). In the group in-person meetings, discussions regarding what students could expect in the classroom, the role of disability services and tutors, and the experience of a typical lecture were presented under the theme of 'work'. In the 'play' theme, an introduction to clubs and societies that might be typical at a college campus were introduced as well as social opportunities and the cafeteria environment were explored. Finally, in the 'rest' theme, stress management and situational anxiety were discussed focusing on the well-being of the student (Lei et al., 2018). Professional psychologists gave some presentations; some were from the school's disability services department, and an autistic student currently enrolled or a graduate from a post-secondary school delivered one session (Lei et al., 2018). All of these group sessions were concurrently practiced as students slept in dorm rooms, ate in the cafeteria, and immersed themselves in the environment of college life. Throughout the program, student ambassadors who were current university students without an autism diagnosis supported the participants.

Evaluation of this transitional program was centered around the responses of the participants in a decrease of worry or concern about attending a post-secondary school, overall satisfaction of the program, and involved written feedback about their summer school experience (Lei et al., 2018). After the evaluation of five summer camp sessions, students reported a reduction in their initial concerns about a university transition and many attendees described being more optimistic about going away from home to attend school (Lei et al., 2018). This transition program addressed support in leaving home, social skill development, daily living abilities, academic preparedness, and the ability to

properly ask for services that can be provided to students with disabilities. The idea was not that students would graduate from this program and only attend this one university, but be better prepared to attend any post-secondary school (Lei et al., 2018). One limitation posed in this study was that only short-term concerns of ASD students were addressed. Student enrollment status and completion at a university were not reviewed and would be helpful in predicting the long-term success of programs like this one.

Finally, the Stepped Transition in Education Program for Students with ASD (STEPS) was reviewed. The STEPS program focuses on two main constructs; self-regulation and self-determination. Self-regulation involves behavior modification and control along with emotion and cognition functioning, while self-determination is defined in this model as the ability to identify and achieve goals (White et al., 2017). The curriculum of the STEPS program consists of two parts; the first is for high school students who plan to transition to post-secondary institutions and the second is for college-enrolled students with ASD. For high school students, collaboration and discussion with parents, educators, support staff, and guidance counselors assists the student with planning and goal-setting. The identification of deficit and transition activities are core functions of the STEPS for ASD students preparing for college (White et al., 2017). For college students, the program provides online content, practice outings, one-on-one counseling time, assistance with identifying resources at the institution and life-coaching skills (White et al., 2017). The STEPS program is designed to be more flexible for the specific needs of the student, which also creates the potential for more challenges in implementation.

Assistive Technology

College professors have a wealth of technology available to assist them in their classrooms today. In addition, students can download and utilize a variety of software applications (apps) to enhance their learning and assist them with the various tasks of college life. In one review of academic apps by Francis, Duke, Kliethermes, Kelsie, & Graff (2018), it was determined that barriers exist for students with ASD in five associated domains:

> Many factors contribute to the disappointing graduation rate of students with disabilities, including those related to five key domains known to influence the success of college students with ASD: academics, social interactions, living outside the family home, executive functioning, and mental health (p. 112).

Although it may be challenging to locate apps that specifically focus on the domain supports that students with ASD require, apps can be highly motivating. Regular use of apps allows for task practice, self-improvement, and organization. Following the needs of ASD students, research indicates that apps, with a combination of explicit and strategic instruction, help learning disabled students best (Ok, Kim, Kang, and Bryant, 2016). Apps should be evaluated to find particular designs that utilize encouragement and reinforcement while also promoting repetition and familiarity for ASD learners (Ok et al., 2016). In one review of multiple apps, the apps that received the best rating for learning disabled individuals provided instructions in manageable steps and connected modules, breaking down skills into smaller sections (Ok et al., 2016). Apps such as myHomework can help students with ASD structure their study time and progress in long-term assignments (Francis et al., 2018). There are also a variety of social interaction

applications that can help ASD students. There are apps focused on finding others who might want to join them for lunch or a study group, allowing the initial contact to be via the app system, eliminating the concerns over approaching another individual for the first time (Francis et al., 2018). Apps can help with keeping track of shopping lists and financial spending, goal setting, and nutritional and fitness activity. Additionally, a variety of applications are designed to help with mental health including the Breathe2Relax app where students with ASD can learn breathing techniques to manage stress and create a routine for planned relaxation and focus (Francis et al., 2018). One of the advantages of recommending apps for ASD students is the low to no cost factor, however, time must be taken to teach the individual how to utilize the application and incorporate it into their daily routine. Safety may be another challenge of using apps and users may not understand the importance of limiting the amount of personal information that is shared through the technology. Many apps, particularly the free versions which have pop-up ads and features, could inadvertently cause students to share information and promote cyberbullying or malicious intents (Francis et al., 2018). One important facet would be to review those concerns with the ASD students in advance of their app use.

Another online program entitled Better OutCOmes & Successful Transitions for Autism (BOOST-A™) is a virtual planning program for students with ASD who are contemplating or planning to move into the post-secondary environment (Francis et al., 2018). The idea behind completing the four modules within the BOOST-A program is to overcome the delay or procrastination that comes with determining the next steps for ASD students after high school, identifying future career paths, empowerment of the ASD student through the determination of strengths and goals, and assistance in the

recognition of a support team (Francis et al., 2018). Although this assistive technology approach is different in that it takes perspective college students and their parents though a one-time, self-paced online program, its intention is to support autism students preparing to leave the high school environment. The initial model gathers information about the student; identifying their interests and strengths. This module also uses activities to reveal life skill successes and potential work preferences. The next online module helps the student identify individuals in their life who can or do act as their support system. It also helps them identify potential support systems in the college environment and provides practice with strategies surrounding engagement in this support. The third module makes recommendations for potential goals and career choice based on the previously submitted information. Finally, the fourth module guides the student through a review of their goals and facilitates some online discussion about positive learning experiences (Hatfield et al, 2018).

Limitations of this review include the small sample size of 39 students and 33 parent participants, where 13 agreed to be interviewed to discuss their thoughts on the usefulness of the BOOST-A program (Francis et al, 2018). Although the results revealed that the virtual technology helped parents and students move forward in their decision-making process around the potential for post-secondary education, they felt they needed an individual to champion their plight and give them clearer and more individualized assistance (Francis et al, 2018). Parents and students also reported a decrease in their anxiety about future career paths, but only 49% of the students interviewed felt the program helped prepare them for leaving home and attending college (Hatfield, Falkmer, Falkmer, & Ciccarelli, 2018).

Coaching

In a moderately sized university in the Midwest, a coaching program was developed to deliver assistance to students entering the institution who self-identified as having ASD. In the initial delivery of this program, eight peer coaches worked with eleven ASD students to provide transitional support from the high school environment to college. This coaching model is designed to deliver more supportive interactions in the first semester, and follows with less frequent intervention throughout the remaining years of enrollment. The coaching program focuses on five competency areas which include time management, resiliency, social skill development, technology use, and advocacy (Rando et al., 2016). ASD students in this program received up to ten hours a week of individualized coaching, typically at least one hour each weekday, and the disability office served as the main point of contact with the parents or guardians of the ASD student. This coaching model was designed to give guidance and structure to ASD students through a peer with a similar age and status in the same college. The coaches had a metaphorical toolbox of skills that aligned with the five competency areas and they could use them as they were needed (Rando et al., 2016). ASD students were then made aware of the focus and could reach out for help, however, there were also structured and routine meeting times in addition to one-on-one requested help. The resulting evaluation of the program showed an enrollment retention of eight out of the eleven students and a decrease in behavioral incidence with ASD students (Rando et al., 2016). One significant priority moving forward with this program is to try and maintain the same coaches each semester as students who were able to build relationships with their coaches reported feeling safer and more comfortable in the post-secondary environment (Rando et al.,

2016). It was also determined that having the coaches selected and trained prior to the start of the semester so that they could reach out and meet the ASD students in advance was important (Rando et al., 2016). When the ASD-identified students were able to express concerns in advance, it became easier for the coaches to intervene and assist. Finally, coaches also were encouraged to work on daily scripts with the ASD participants; planning routine daily events so that if the participant got derailed, they could revert back to the script and get back on track for the day (Rando et al., 2016).

In another study using interviews of students who participated in the Check and Connect coaching model, success was demonstrated with students categorized with intellectual disabilities. The Check and Connect model use a coach who "checks" on the student regularly and "connects" them with needed support systems or assistance. This has shown to increase retention and pass rates while also gaining positive feedback from student participants (Qian, Clary, Johnson, & Ecternacht, 2018). Some common themes of what coaching student participants requested included help with academic support, social opportunities, career guidance, and community living concerns. Students reported specific needs such as navigating class registration, and email accessibility as well as others who needed help finding methods to deal with anger and depression (Qian et al., 2018). In the coaching model, the coach is to be a liaison to finding resources and plays a valued role in creating a larger support system for intellectually disabled students.

The technique of coaching may also be beneficial in specific learning environments where a particular skill is needed. One study on coaching, described by Kuder and Accardo, evaluated the coaching effects where one ASD student enrolled in an early childhood education program completed the required practicum using the coaching

method (2018). In this design the student attended one-hour sessions each week with the limited intention of coaching the student through the skills necessary to complete the practicum successfully. Coaching sessions consisted of reviewing the previous weeks information, introduction of a new skill, demonstration of the skill by the coach, role play of the skill by the student, and repetition of the skill until repeated successful performance was obtained (Kuder & Accardo, 2018). The ASD student then received an email with notes from the session and skill evaluation detail. Throughout this coaching process, the student was observed in the practicum by the coach for additional feedback. Although this study involved only one student, the individual was able to successfully complete the practicum experience. One potential disadvantage of the coaching model is the expense required for one-on-one work with ASD students (Kuder & Accardo, 2018). In this particular study, the focus did not cover the range of diagnostic deficits indicated in the DSM-V, but focused only on what was necessary for the practicum course work.

Universal Design

The concept of Universal Design (UD) in the classroom relates to students with ASD because the set idea is to incorporate practices in the learning environment that would be good for all learners. As has been previously presented, ASD students may find it challenging to visit the office of disability services to obtain accommodations. In a universal design plan, educators would prepare their classroom environment and teaching practices so that all students are accommodated without the need for acknowledgement. The principles of UD were developed by the Center for Universal Design and promote the advancement of educational resources and environments that:

> embody (1) equitable use, (2) flexibility in use, (3) simple and intuitive use, (4) perceptible information, (5) tolerance for error, (6) low physical effort, (7) size and space for approach and use (Burgstahler & Russo-Gleicher, 2015, p. 201).

A broad understanding of potential disabilities and diversity in the classroom is key to this concept being applicable in the post-secondary setting. Making decisions about how a course will be developed based on what would benefit all individuals and having the ability to employ flexible teaching strategies is important in this model. Some tools that may be incorporated into UD are syllabi statements that offer opportunities to meet with the professor with questions or academic accommodation needs and provide contact information for additional resources at the institution. The articulation and repetition of ground rules for the classroom can promote improved behavior, specifically when instances that violate the stated rules are immediately addressed (Burgstahler & Russo-Gleicher, 2015). Redirecting students who may get off topic in their discussions, allowing a variety of small group, online chats, and in-class participation may allow students a venue to express their thoughts in a way where they are most comfortable. Finally, clearly written directions for assignments with step-by-step instructions, and the predictability of a routine can help ASD students within the UD design (Burgstahler & Russo-Gleicher, 2015). The physical environment may be more difficult to change, but ensuring all students can easily see the teacher and ensuring that class times are broken up by activities that require participants to move around in their classroom or providing breaks can be helpful for all students, but especially those with ASD (Burgstahler & Russo-Gleicher, 2015).

The use of UD is challenging to evaluate as, by nature, it reportedly alleviates the need to know which students may need additional assistance inside the classroom. Unfortunately, timed exams and assessments make the concept of UD questionable. Arguments that all students would benefit from take-home exams providing extra time and the potential for a quiet space, alter with the notion that a true measurement of learning cannot be provided in this manner (Gose, 2016).

Appendices A and A1 connect the current methods reviewed in this document with the diagnostic criteria for ASD from the American Psychiatric Association. Each deficit was reviewed within each model to determine whether the model met the need to address each deficit. A reflection of the diagnostic qualifications for ASD is significant to determine if current methods for post-secondary education inclusion are appropriate and successful.

Chapter 3

Methods

A comprehensive review of the literature on Autism Spectrum Disorder (ASD) and learning support systems in post-secondary education was conducted.

Procedures

Search procedure. A careful review of the literature related to postsecondary educational support and ASD was conducted. The review highlighted the following topics: (a) Autism Spectrum Disorder, (b) post-secondary educational supports for ASD, and (c) methods of support being piloted or used for ASD students.

Libraries used. There was only one library used for the search of sources for this project. The Harrisburg Area Community College library was used for this research paper.

Search engines and databases used. The following databases were used to search for the sources for this project. The search databases were ERIC, ProQuest Central, and Chronicle of Higher Education.

Search items. Several search terms and key words were used to identify source for this project. The search terms included (a) Autism Spectrum Disorder, (b) disability in post-secondary education, and (c) disability services.

Boolean strings. Boolean strings were considered for the literature search. Boolean strings used: (a) ASD and college, (b) ASD and adults, (c) ASD and disability services, (d) ASD and post-secondary education, (e) disability services and college, and (f) ASD and cause.

Age of the sources. The significant literature has been reviewed. Sources from the last 7 years have been considered for inclusion in the review of literature. Pertinent historical or seminal articles were also considered.

Inclusion criteria. There were four inclusion criteria. Inclusion criteria included (a) literature published since 2012, except historical sources; (b) English-language text; (c) peer-reviewed articles; and (d) full text.

Exclusion criteria. There were four exclusion criteria. The exclusion criteria included (a) literature published before 2012, except historical sources; (b) text not published in English; (c) articles not peer reviewed; and (d) abstract only.

Chapter 4

Results and Findings

With the increase in diagnosed cases of Autism Spectrum Disorder and the improvement in techniques designed to encourage learning and self-sustainment, more individuals with ASD are appearing in colleges and universities. This review was designed to assess the literature and review methods to enhance an ASD student's ability to be successful in the post-secondary environment. The elementary, middle school, and high school environments involve fewer opportunities for independence, creating structured atmospheres for successful growth. College settings can create many barriers for ASD students from time management to the need for self-advocacy and also must address commuting, living independently, and environmental changes. Because of the improvements in the diagnostic capabilities for ASD, the DSM-V diagnostic coding, used in Table 2.1, to evaluate each of the current models being utilized or piloted in the college communities today is the chosen tool to recommend best practices. Determining if the success-enhancement model demonstrates an aspect of assistance that addresses each of the diagnostic criteria for ASD will allow for a robust comparison between models.

In the mentoring model, using a specialist mentor versus a peer mentor is preferable. The specialist mentor helps maintain focus by clearly defining the college's expectations with a focus on time management skills. The specialist has a clear understanding of the colleges existing resources and has shown to be more consistent in mentoring. ASD student mentees scored significantly higher than ASD students without mentoring programs in the category of academic skills and university life (Lucas & James, 2018). ASD students in this group also reported that assistance with time

management skills, which speaks to a DSM-V deficit of restricted interests, was very beneficial (Lucas & James, 2018). In general, as university environments include more ASD students, mentoring in addition to counseling services can help ASD students cope with social and sensitivity issues (Anderson et al., 2018). Peer mentoring demonstrated no specific findings related to focus and the speculation is that peer mentors will teach what they know, but may not have a comprehensive understanding of ASD and/or the university's opportunities. To identify and support deficits in social and emotional reciprocity, both peer and specialist mentoring offered supportive learning. Although non-ASD students were neutral in the scoring of a mentor project at one institution, students with ASD reported that mentoring significantly helped them with emotional support and social relationships (Lucas & James, 2018). In a peer mentor program one participant reported:

> University is very stressful for a number of factors, namely time constraints. The mentoring has helped me find tools to help change this. I am less prone than previously to feeling depressed (Choo et al., 2017, p. 11).

In the deficit of nonverbal communication, both specialist and peer mentoring has proven valuable. The relationships that are built between the mentor and mentee help to bridge this gap, but can be specific to each individual experience. Models that allow for mentors to be trained may be preferable so that the experience for mentees is consistent:

> While specialist mentors were provided with training regarding ASD, further training on common co-occurring difficulties and support strategies may prove beneficial. A separate study that collected feedback from

> mentors also concluded that mentor training would benefit from more practical ideas on supporting mentees with ASD (Choo et al., 2017, p. 13).

The deficit in social interactions is met in the mentoring model by regular mentor/mentee meetings, and by the mentor being a guide when questions arose about appropriate contact plans with faculty and university staff:

> Mentoring helped mentees to integrate into the university community, often going beyond academic and emotional support into social and extracurricular domains (Lucas & James, 2018, p. 702).

The complexity of ASD students maintaining and understanding relationships was maintained in both the peer and specialist mentor programs by relationship building with the mentor. This personal relationship with the mentor was often perceived as a friendship and paved the way for as-needed support. This partnership was designed to bridge the ASD student into the environment of post-secondary education and acted as a blueprint for further interactions with others (Lucas & James, 2018). Although the one-on-one relationship may be the costliest method, ASD students found comfort in knowing they had a defined person to communicate with and they did not need to initiate the affiliation. Finally, the deficit of repetitive behaviors and inflexible routines is better met in specialist mentoring through coping skills that include organizational skills and test preparation. This increased confidence level for ASD students, support related to test-taking, and greater preparation for the next academic year were all reported by ASD students receiving specialist mentoring (Lucas & James, 2018).

In the transition model, deficits of highly restricted interests were not generally supported. Although support through online resources was made available, the onus for

support was directed toward parental and advising services. One major concern in getting ASD students prepared for the independence of university life is the separation from their support system at home. The transition models rely heavily on practicing skills with the assistance of support they are familiar with, but it appears more independent practice is necessary. Deficits in social and emotional reciprocity were established and practiced in the transition programs, however, some of this was met by simply making students aware of their resources in the college environment. Having structured and also spontaneous social opportunities helped develop occasions for learning and discussion between the ASD student and the transition team:

> Many students commented on finding this diverse socializing experience to be particularly useful and helped to boost their confidence, and many were looking forward to new social opportunities that the university can help bring (Lei et al., 2018, p. 10).

Deficits in nonverbal communication are again introduced and practiced in the transition model and in addition, ASD students are made aware of support systems that are available to them so they can be better prepared once their college experience commences. Transition programs front-load the preparations for the ASD student and rely on additional supportive elements provided by the institution. Transition programs have a strong focus on meeting the deficits in social interactions, with much planning and preparation surrounding the social environment:

> The purpose of community-based practice outings is typically to encourage social involvement that is goal-directed (White et al., 2017, p. 3076).

Transition programs met the deficits of developing and understanding relationships and the inflexibility of routines by practicing skills in the college environment. Having opportunities to have ASD students visit, and even sleepover at post-secondary institutions, allows them a clearer picture of college life. Being able to walk the campus, find out where counseling and support staff are located, and practice time management skills is invaluable. Programs in the transition model where potential college students with ASD can visit an institution in the summer or between semesters, may allow the student to gain comfort in their surroundings. Allowing students opportunities to meet individuals at the institution that can help them, allowing time to build relationships and a familiarity of routine is useful and will help the ASD student better prepare for success.

Assistive technology appears to meet fewer of the deficits than any other model that was reviewed. No specific findings were available for deficits in non-verbal communication, social interaction, and the development and maintenance of relationships. Because the ASD student regularly requires guidance and support, apps on a phone or other electronic device may not be the best method for success although it may be a useful aid when coupled with other method(s). Assistive technology apps can help ASD students stay focused when there are limited interests by chunking information and tasks into smaller pieces, so the amount of time spent on items where there is little interest can be controlled:

> The app [Be Focused] enables users to monitor progress by tracking the completion of smaller tasks with the ultimate goal of increasing productivity and decreasing stress and frustration related to long-term assignments or projects (Francis et al., 2018, p. 119).

Deficits in social and emotional reciprocity are addressed with mental health applications. These apps can be used to help students track their own moods and analyze triggers as well as options to share their thoughts through posts with others:

> Individuals with mental health needs report valuing support from online communities and students with ASD report benefitting from tools to help them keep track of their progress (Francis et al., 2018, p. 119).

It is important that ASD students do not feel alone in their new college environment and connections through apps can be a way of belonging for some. Deficits in repetitive behavior and inflexible routines could be resolved in prioritization and detailed goal setting using assistive technology applications:

> The majority of participants reported that the BOOST-A provided clarity around what steps to take, and supported the process of taking action to prepare for leaving school. Many adolescents engaged in a number of new activities after using BOOST-A including part-time jobs, work experience, receiving mentorship, attending training courses, career open days, and training in life skills, social skills, and emotional regulation (Hatfield et al., 2017, p.382).

In the coaching model, the deficit of restricted focus is met using time management skill practice, regularly reviewing grades and maintaining organizational skills that will allow the student to complete a variety of assignments on time. Additionally, coaches assist with test-taking strategies and can be a liaison with the institutions disability services office to ensure accommodations are appropriately designated:

> Students also shared that their coaches helped them focus and stay on track with their schoolwork, provided constructive feedback, and held them accountable for completing their work (Qian et al., 2018, p. 198).

Role play practice and the organization of social opportunities played a large part in deflecting the deficit of social and emotional reciprocity. In the coaching model, individualized discussions can be had between the ASD student and the coach, yielding many opportunities to discuss emotional stability and the social environment. In the deficit of non-verbal communication skills, coaches worked to connect students to appropriate college resources and often practiced this skill, so students could eventually manage this outreach for themselves:

> The RASE [Raiders on the Autism Spectrum Excelling] program is based on a transition approach that offers more intensive support for the first year of college, followed by less frequent intervention in subsequent years to encourage a focus on increased independence and overall growth for the students involved (Rando et al., 2016, p. 258).

The deficits in social interactions and the development of relationships were met generally through practice with the coaches. In this model, social skill development was modeled by the coaches and developed through practice and events that were planned to give ASD students opportunities to interact with others:

> Students frequently mentioned that meetings with their coaches focused on their social participation at the college. Several students indicated that their coaches helped them expand their social networks and friendships across campus (Qian et al, 2018, p. 198).

Getting ASD students to branch out into new environments, even within the college campus, can be problematic. The coaching model, similar to the mentoring programs, gives the student a point of contact, someone to practice a skill with, and potentially someone to go to the location with them until they are comfortable on their own. Finally, the coaching model met the deficit of routine inflexibility through the work of scripting a routine:

> Coaches also were encouraged to work with students on the development of a daily "script" which outlined the schedule of events beginning the moment the student awakened until their bedtime routine with an alternate script in the event that life intervened and the student needed to redirect themselves to a plan B scenario (Rando et al., 2016, p. 260).

The last model reviewed is Universal Design. In this model, the classroom is specifically discussed in each parameter and deficits are addressed on that setting alone. The deficit of restricted interests is met in the Universal Design by having the instructor reinforce the expectations of the class:

> UDI [Universal Design of Instruction] strategies that can proactively address potential behavior issues include setting clear expectations, encouraging regular and effective communication with students, facilitating engagement in cooperative learning assignments in the category of "interaction," and providing regular feedback and corrective opportunities in the category of "assessment." (Burgstahler & Russo-Gleicher, 2015, p. 203).

Because the idea of Universal Design centers around the faculty member as the ASD student's point of contact, finding ways to communicate and overcome deficits in social reciprocity include conversations with the faculty to find additional services if needed:

> One UDI strategy to address individual needs in an inclusive manner to promote a positive class climate that might help a student initiate a conversation with an instructor regarding his/her disability, disclosed or undisclosed, is to include a statement in the syllabus that invites students to meet with the instructor to discuss disability-relayed and other learning concerns (Burgstahler & Russo-Gleicher, 2015, p. 203).

In general, offering a variety of methods for participation is a pillar of the concept of Universal Design. In this method, the student is still required to initiate the discussion with the faculty member, however, ideally the coursework is planned to make that easier or even unnecessary. To meet the deficit of nonverbal communication skills, multiple means of engagement are encouraged:

> UDI strategies in the category of "interaction" include giving all students specific instructions, verbally and in print, regarding expectations for participation in discussions, presentations, and small groups and to offer a variety of ways to communicate. They should offer multiple options such as online discussion boards, in-class discussions, small groups engagement, since individuals may be more comfortable participating in some formats more than others (Burgstahler & Russo-Gleicher, 2015, p. 204).

Similarly, the deficit in social interaction is met when the ASD students within the class are strategically not singled out by virtue of an accommodation. When the Universal Design strategies are in place for the entire class:

> Meeting the needs of a student with ASD in this way avoids stigmatizing that student, minimizes the need for accommodations, and creates a more welcoming and inclusive environment for everyone (Burgstahler & Russo-Gleicher, 2015, p. 203).

Although the deficit of developing and maintaining relationships is not directly addressed in the Universal Design model, a temporary relationship with the faculty member is included. In this model, students may or may not be visible to the faculty member as having a disability and therefore the potential that the student goes through the class without this identification is possible. There are benefits and weaknesses to that happening. One weakness being a relationship that could provide continued support was not made. However, if a student self-identified, additional resources could be generated. This, of course, is not the basis for Universal Design as in this plan, all students would be able to flourish in the environment created. To address the deficit of repetitive behaviors, Universal Design plans work to provide consistent and predictable support:

> The instructor could allow students to sit in the same place each class and share a class routine in spoken and written form. For example, an instructor could review prior class topics at the beginning of each class and then summarize content and give assignment reminders at the end of the class session (Burgstahler & Russo-Gleicher, 2015, p. 205).

One major hurdle to UDI is the onboarding of faculty to this way of thinking. If an ASD student takes one class where the faculty member subscribes to Universal Design, but all of the faculty teaching their other courses do not, it is unlikely that the student will be successful.

Chapter 5

Discussion, Conclusions, And Recommendations

It has been estimated that forty percent of adults with ASD will enroll in some form of post-secondary education (Volkmar et al., 2017). This is not surprising as detection and diagnosis of ASD has been completed earlier in life and with early diagnosis comes the opportunity for early intervention and improvements in individuals with ASD. The review of diagnostic codes that define ASD gives some insight into the health science of needed supports. This diagnostic coding is regularly reviewed and updated creating the best listing of symptoms for diagnostic identification. Using this diagnostic coding as a guide to formulate the best supportive measures for ASD students was the mechanism used in this review. The expectation that ASD students will continue to enroll in post-secondary educational institutions is clear. It is likely that the number of ASD students attending college will increase as families hold higher expectations for their future (Kruder & Accardo, 2018). Unfortunately, colleges and universities may not be prepared for this change as ASD students can have a variety of individual needs. Alternative methods of helping students with ASD including a more flexible curriculum design and a better mechanism of reporting the disability might be useful from a student perspective (Anderson et al., 2018). Consideration of the ASD students' needs and the institutional capabilities is some common ground that must be discovered. Issues for college campuses to consider include are creating an environment of acceptance and support for a wide range of disabilities including ASD, advocating for barrier-free support, increasing the number of faculty members and staff with disabilities, conduct continued research on social integration of students with ASD, and raise awareness of

disabilities through published articles and broad discussions (Leake et al., 2014). Commonly, ASD students struggle with communication, social skills, behavioral issues, and sensory challenges. ASD students may be disruptive when faced with new situations for which they cannot devise a response or plan. Ultimately, accommodations will only work if they fit into the student's functional limitations (Brown, 2017). Students with ASD who may have routinely had assistance in high school need to now self-disclose about their conditions at the post-secondary level to be considered for educational support services. Although this may not be the case when the Universal Design model is used, there has been no clear research that additional services may not also benefit ASD students within a classroom using UDI. These students may be fearful of disclosure, may believe they do not require assistance at the college level, or may find it difficult to locate and communicate with the right resource locations and staff on campus. College life presents many new challenges for ASD students including living on campus, eating in the cafeteria, and potentially being in a new community or location. Academic engagement along with environmental acceptance are important predictors of ASD student success (Brown, 2017).

The delivery of education can vary greatly between professors and even changes in the physical environments of classrooms can be overwhelming for these students. Coupled with the varied manifestations of ASD in individuals, faculty and disability service employees need multiple resources to help students be successful. This information leads to the suggestion that peer or professional mentoring might provide the most flexible, student-specific assistance measure, but is also requires the college to invest in significant resources for these types of services. Parents and caregivers have a

substantial role in assisting the ASD student to grow and succeed in the college environment. Family support of ASD students is important, however, at the same time these students need to find the confidence to maneuver college life on their own. More research needs to be conducted focusing on the parental role in the transition to higher education (Van Hees et al., 2015). The large volume of variations from one individual ASD student to the other make the difficulty of selecting a single model unlikely. Parents, caregivers, counselors, and medical personnel who have worked with the ASD student should reflect on post-secondary assistance models and find what might work the best for their student.

In this review, five current models of ASD student support were examined using the DSM-V diagnostic coding for ASD as a guide. This diagnostic coding provided a list of deficits which could then be investigated in the literature to determine if each model was meeting the deficit or ASD student need. The findings reveal that there are deficits left unaddressed by some degree in each of the current models. Although the specialist mentoring model appeared to have the most robust plan for addressing each deficit, the peer mentoring model exhibited no specific findings in the deficit for restricted interests. Peer and specialist mentoring offered flexibility and a variation of assistance based on the individual needs of the ASD student. It is clear that post-secondary students with ASD routinely have difficulties which include difficulties within the classroom, but non-academic issues are also of considerable importance. ASD students commonly report feelings of loneliness, anxiety, and depression while attending a post-secondary institution (Jackson, Hart, & Volkmar, 2018). The mentoring models allow for a single contact person the student can reach out to when they need assistance or feel

overwhelmed. Without a mentor, ASD students may find it difficult to locate an appropriate faculty or staff member to assist them. Conversely, the mentoring and coaching models cost the most for colleges to endure and still require the student to first disclose their condition.

Programs following the transition model met many of the deficits, however the summer school program did not offer a solution for the deficit in restricted interests. This model places a lot of work on the family members or individuals supporting the ASD student at home in order to follow online lessons, engage in family discussions, and complete college planning. In general, the support system that is in place within the home will be grossly important as the ASD student moves forward with a post-secondary plan. In addition to the needed support from family members, the perceptions of faculty members within the institution are also critical. When faculty members have a positive attitude about disability services, students show a greater willingness to seek out and use granted accommodations. However, when faculty members are unfamiliar with disability services and potential accommodations, the student may follow with their own unawareness (Brown, 2017). The transition programs that offer overnight opportunities at the campus can allow ASD students and their families to better understand challenges that they may not have considered previously. At times, the college experience can be very different in reality than that which is anticipated. Visiting the campus when there are minimal students on campus can give the ASD individual a chance to visit the cafeteria, find the necessary offices, classrooms, and other locations they will need while not feeling overwhelmed by large numbers of people. Conversely, students may then find it more distressing when they attend campus after the start of the semester. The transition

programs reviewed also included participation and information from parents and caregivers to ensure that their individual concerns were addressed.

Online resources and applications that can be downloaded to a phone or computer may assist ASD students and minimize the time that students are required to attend a physical campus or classroom and may also tap into the interests of students and the support systems at home. Although the assistive technology model demonstrated the fewest amount of connections to the diagnostic deficits, assistive applications may work as a secondary or additional supportive model for ASD students and can easily be incorporated in other models. Finding methods to help with time management and organization are important for any college student, and assistive apps can help with alarm notifications and routine in ASD students.

The coaching model allowed for more one-on-one opportunities as we saw in the mentoring design. Developing social skills and practicing using role-play and modeling are positive ways ASD students can learn from coaches. The concept of a daily script in the coaching model was very useful to keep ASD students on task and organized in their new college routine. Finally, the idea of universal design gave opportunities for ASD students to feel more inclusive and welcome. One of the major drawbacks to universal design is the buy-in of faculty. ASD students may have a variety of faculty members and they all may handle their classroom structure and expectations differently. An effective use of universal design would require a change in the college culture to be successful. Transition programs that also incorporate mentoring may create the best combination of models to meet all ASD deficit needs. In this way, students can participate in sessions preparing them for the college environment while connecting with a mentor to help them

progress. Consideration for program costing, volunteers, and support staff are high on the list of concerns from post-secondary institutions.

Moving forward, recommendations include paying attention to the disability rights movement which has an overarching goal to have all individuals treated equally and accepted fairly. Post-secondary education, although not required to promote inclusivity, is positioned to create and lead with advocacy for students with disabilities while working towards a culture of acceptance. Colleges and universities can apply a wide variety of support models for ASD students. The models reviewed here all demonstrated some measure of success for at least one student, and should be utilized for continued measurement and improvement. It is not surprising that ASD students using a variety of support methods report mixed results. The need to identify which method might be better for each individual student is overwhelming, but ideal for success. The diversity of needs for each ASD student makes it difficult to select a method that will work for all (Kuder & Accardo, 2018). There is also a strong argument to be made that ASD students receive training that is specifically designed to help them with their specific career or employment choice. Career guidance, work experience, internships, and collaborations with employers in their work environments can assist ASD individuals with clear expectations and determine the need for a post-secondary track (Anderson et al., 2018).

More research needs to be completed to better understand the options, strengths, and weaknesses of current post-secondary support systems specifically for enrolled students with ASD. Additionally, an increased emphasis on the strengths of ASD students may produce a more positive view of disabilities in general, creating a more positive

acceptance of support systems in the post-secondary environment (Anderson et al., 2018). Support must extend beyond the classroom and whatever provision is being planned needs to be discussed and accepted by the ASD student in advance. To be the most successful, plans for the transition from high school to post-secondary education are going to require individual discussions with the student, parents, teachers, and counselors. Programs that address the prospects of independent living, core ASD deficits, and functional independence will be extremely helpful (Elias & White, 2018).

In conclusion, the increased enrollment of ASD students in post-secondary education poses numerous challenges and opportunities for college institutions. At the same time, the core deficits of ASD and the stresses of post-secondary education pose significant obstacles for ASD students. Finding the best model to help these students succeed will include connections with the individual student, their parents or caregivers, and the faculty and support teams. Accessible educational needs coupled with planned support using evidence-based methods will increase the potential for ASD students to complete their chosen program. The literature has shown that there is a gap between the enrollment of ASD students and the delivery of services for these students (Brown, 2017). There may be a myriad of support services needed for ASD students as the challenges they encounter in college may not yet be understood until they find themselves actively ensconced in their situation. As students with ASD may not self-disclose their needs in the college environment, options such as universal design may need to be utilized so that educators can create opportunities for all students to succeed when they are unaware of specific individual student needs.

Appendices

Appendix A Current Models and Diagnostic Criteria Evaluation

Author(s)	Current Model	Diagnostic Criteria from the APA's DSM-V		
		Deficits of highly restricted interests or focus	*Deficits in social and emotional reciprocity*	*Deficits in nonverbal communication skills*
Lucas & James	Mentoring (specialist)	Academic skills and university expectations including time management	Specialist mentor support with problem solving and well-being	Bridging between home/college, university protocol, and support services
Choo et al	(peer)	No specific findings	Peer mentors offered assistance in emotional support and appropriate emotional reactions	Building relationships between the participant and peer mentor
Shmulsky et al	Transition programs	Ongoing support may use online resources to help students with time management skills	Students are made aware of support systems in advance	Students are made aware of support systems in advance
Lei et al		No specific findings in the Summer School program	Social skills are practiced in the Summer School program	Summer School program introduced students to on-campus services
White et al		Common challenges of ASD students indicated as part of Step 1 framework	Emotion regulation along with opportunities for goal setting	Counseling session include meeting new people and cognitive flexibility skills
Francis et al	Assistive technology (apps)	Scheduling and organizational assistance	Mental health applications to track moods and	No specific findings

			share information with others	
Hatfield et al		The beginning module helps the student identify interests and skills with preceding goal-setting	Life skills are discussed with the identification of a support team	Preferences in communication are discussed early, however, would only be potentially a part of an individual goal
Rando et al	Coaching	Time management and organizational skills and a regular overview of grades	Role play practice	Advocacy and self-navigation
Qian et al		Academic support was individualized	Participants were able to talk to coach about emotional issues and receive advice or encouragement	Coaches assisted students in connecting with college services
Burgstahler & Russo-Gleicher	Universal Design	Providing regular feedback and communication	Connecting the student with services through the faculty member	Offering multiple methods for interaction and participation

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-V-TR*. Arlington, VA: American Psychiatric Association

Appendix A1 Current Models and Diagnostic Criteria Evaluation, cont.

Author(s)	Current Model	Diagnostic Criteria from the APA's DSM-V		
		Deficits in social interactions	*Deficits in developing, maintaining, and understanding relationships*	*Deficits of repetitive behaviors and inflexibility to routines*
Lucas & James	Mentoring (specialist)	Guiding and being a liaison for initial contact when needed	Relationship building with mentor as a guide to additional relationships	Coping skills and support for exams and organization
Choo et al	(peer)	Regular meetings with peer mentors to work on social adaptation	Peer mentorship has a strong focus on developing relationships	Although this may be a part of one-of-one peer discussions, findings were not represented
Shmulsky et al	Transition programs	Early discussions with parents, early visits to campus, individual support in first year	Students meet trained advisors and know where they can go for assistance, predetermined living situations are planned	Information collected from parents helps determine the best assistance in what works for students
Lei et al		Social interaction is a large portion of the Summer School program	Participants in Summer School program practice skills sleeping over at the institution	Students can experience a practice run of college life in the Summer School program
White et al		Preparation and practice with social skills is a part of both steps in the program	Minimal skills practice for relationship building. Program does include identification of resources and supports along with addressing social difficulties	Planning for the transition, including the responsibilities of being a college student

Francis et al	Assistive technology (apps)	Online communication, meeting apps	No specific findings	Prioritization of work and assignments, goal-setting
Hatfield et al		No specific findings	No specific findings	Modules to help the student select the best employment opportunity based on behaviors and preferences
Rando et al	Coaching	Social skill development and modeling	Contact with their assigned coach and relationship building as a component	Development of a daily script to help with scheduling from morning through bedtime
Qian et al		Program had a club for participants and social events were frequently planned	Relationship with coach was positive and helped build a model for relationships with others	No specific findings
Burgstahler & Russo-Gleicher	Universal Design	Making the classroom universally accessible avoids stigmatizing and creates inclusivity	No specific findings	Encourages routine in the classroom with predictability and routine

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